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Checklist of the arbuscular mycorrhizal fungi (*Glomeromycota*) in the Brazilian semiarid

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Abstract — Seventy-nine species of arbuscular mycorrhizal fungi (AMF) are reported for the semiarid Caatinga biome of Northeast Brazil. Data are based primarily on research by L.C. Maia and co-workers during the past 20 years. The full checklist is available at www.mycotaxon.com/resources/weblists.html.

Key words — *Glomeromycetes*, symbiosis, biodiversity, taxonomy

Introduction

Arbuscular mycorrhizal fungi (AMF) form symbiotic association with roots of plants, a mutual connection that may have contributed to the evolution and survival of land-plants and fungi for over 400 million years (Smith & Read 1997).

Thaxter (1922) felt that AMF belonged to the *Endogonaceae*. Based on the symbiotic habit, Morton & Benny (1990) placed all AMF into the new order *Glomales* as a monophyletic group. The AMF are now classified in the phylum *Glomeromycota* (Schüβler et al. 2001) with approximately 220 described species.

Fitter (1990) noted that the fundamental ecological importance of AMF fungi requires research of their diversity in various ecosystems, and in discussing the place of AMF community in a given ecosystem, Sanders et al. (1996) questioned whether there is a relationship between which plants are colonized and what effect AMF have upon both plants and the ecosystem. These questions indicate the need for intensive studies and justify a survey of AMF in different ecosystems.

Most investigations of AMF in Brazil pertain to plant crops and not to natural ecosystems (Maia et al. 2006). The review paper by Trufem (1996) on AMF research within the Amazon, Atlantic Rain Forest, and Cerrado, cited the need for studies in the Caatinga and Pampas, two less studied Brazilian biomes. The Caatinga, which covers more than 800,000 km^2, representing 70% of the Northeast region and ~11% of Brazil (Drummond et al. 2000), is characterized by a hot dry semiarid climate and vegetation with trees and shrubs (many spiny, some xerophytic) in the *Apocynaceae*, *Bromeliaceae*, *Cactaceae*, *Euphorbiaceae*, and *Leguminosae* (Leal et al. 2003). One recent study (Stürmer & Siqueira 2008) lists only 30 AMF species from the Caatinga biome.

The new records contribute additional data about AMF diversity and a more complete list of AMF species from the Brazilian semiarid Caatinga biome.

Material and methods

Data cited originated from the authors as well as from the Web of Science; student theses and scientific proceedings have also been considered. References consulted include Albuquerque 2008; Freitas 2006; Lemos 2008; Gattai 2006; Goto et al. 2009, 2010; Lima et al. 2007; Maia et al. 2006; Mergulhão 2007; Mergulhão et al. 2007; Morais 2007; Pagano et al. 2007; Silva et al. 2007, 2008; and Souza et al. 2007. Gigasporioid-producing AMF species are classified according to Oehl et al. (2008); earlier synonyms are also listed.

Results and discussion

Seventy-nine species were found in the Caatinga, of which seven are new records for Brazil (*Dentiscutata colliculosa, Diversispora spurca*, *Glomus arborense*, *G. pallidum*, *Racocetra intraornata, Scutellospora dipurpurescens*, *S. pernambucana*) and three (*D. colliculosa*, *R. intraornata*, *S. pernambucana*) have been recently described. This brings the number of known Brazilian AMF to 106 species, including the 99 taxa cited by Stürmer & Siqueira (2008).

Compared with this last review (Stürmer & Siqueira 2008), the data presented here increase the number of species known in Brazil, which now represents at least 48.2% of the valid species worldwide. Most families of *Glomeromycota* (except *Geosiphonaceae* and *Pacisporaceae*) are represented in the Caatinga, with the number of species representing 74.5% of those recorded from Brazil and 35.9% of those known worldwide.

The majority of AMF studies in the Caatinga have so far focused on agrosystems (Stürmer & Siqueira 2008). However, despite the low number of inventories in the Caatinga, 57 species were listed from vegetation preserved in the biome, almost equaling the number of species (60) recorded from agrosystems throughout Brazil. This preliminary estimate of the AMF diversity

in the Caatinga suggests that a high diversity will probably be found in the biome in the future, particularly considering the high number of plants and animals also present (Leal et al. 2003).

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